FIVE-YEAR REVIEW REPORT

MAIN STREET WELL FIELD SITE
ELKHART, INDIANA

September 1997

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9/30/97
Date

I. Introduction

A. PURPOSE

The United States Environmental Protection Agency (U.S.EPA) has conducted a Five-Year Review of the Remedial Action (RA) work at the Main Street Well Field Site, Elkhart, Indiana. This review was intended to evaluate whether the RA remains protective of public health and the environment.

Section 121 of the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substance Contingency Plan (NCP), require that periodic (no less often than five years) reviews are to be conducted of sites where hazardous substances, pollutants, or contaminants remain at the site above levels that will not allow for unlimited use or unrestricted exposure following the completion of all remedial actions for the site.

OSWER Directives 9355.7-02 (Structure and Components of Five-Year Reviews, May 23, 1991) and 9355.7-02A (Supplemental Five-Year Review Guidance, July 26, 1994) provides that the U.S. EPA will conduct five-year reviews as a matter of policy (Policy Review) at (1) sites where no hazardous substances will remain above levels that allow unlimited use and unrestricted exposure after completion of the RA, but the clean up levels specified in the Record of Decision (ROD) will require five or more years to attain, or (2) sites addressed pre-SARA at which the remedy upon attainment of the clean up levels, will not allow unlimited use and unrestricted exposure. The five-year review of the Main Street Well Field Site RA was conducted in accordance with this policy.

The U.S. EPA has established a three-tier approach to conduct five-year reviews, the most basic of which provides a minimum protectiveness evaluation (Level I review). The U.S. EPA determines the level of review based on site-specific considerations, including the nature of the response action, the status of on-site response activities, and proximity to populated areas and sensitive environmental areas. A Type Ia review was conducted at the Main Street Well Field Site, and consisted of (1) a review of all documents associated with the RA including progress reports and (2) a site visit.

B. Site Background

Summary of Site Conditions

The Main Street Well Field (MSWF) is located in the City of Elkhart, Elkhart County, Indiana, at 942 N. Main Street. It covers approximated 48 acres. The Elkhart Water Works, (EWW) maintains four well fields to ensure sufficient supply for the city's water demand. MSWF is the primary water supply for the city and supplies approximately 50 percent of the EWW's production capacity for the city of approximately 44,00 people. The well field currently contains 15 production wells, 4 interceptor wells used as production wells, 2 two million gallon storage tanks, an air stripping facility, six recharge ponds and a treatment/pumping station.

The first known incident of ground water contamination at MSWF was in the mid-1950's. Ground water was contaminated with phenols as a result of releases from a fuel tank farm east of the well field. The contamination problem was mitigated by excavating six recharge ponds in the well field and diverting water to those ponds from Christiana Creek. To facilitate this action, EWW acquired the water rights to Christian Creek from the Indiana-Michigan state line to MSWF.

In 1981 MSWF, was sampled as part of the U. S EPA's National Ground Water Supply Survey. The well field was found to be contaminated with trichloroethene (TCE) at 94 part per billion (ppb), 1,2-dichloroethene (1,2-DCE) at 33 ppb, 1,1,1-trichloroethane (TCA) at 5 ppb and 1,1-dichloroethane (DCA) at 2 ppb. Observation wells were installed on the east side of the well field and two industries were found likely to be sources for the contamination. The city installed two interceptor wells in the well field on the eastern boundary and took the affected wells out of service. The interceptor wells were discharged to Christiana Creek under an NPDES Permit. TCE in the finished water and the remaining production wells dropped significantly following installation of the interceptor wells. In 1984, however, TCE levels on the west wide of the well field began to increase.

The regional aquifer, inclusive of MSWF, is part of a designated sole source aquifer. The direction of regional ground water flow is generally south, toward the St. Joseph River and its tributary, Christiana Creek. This southerly flow is more predominant east of the well field. In the area west of the well field, the ground water flow tends from northwest to southeast toward the well field. The ground water flow in this area is subject to influence by natural factors, such as Christiana Creek and by ground water pumpage and recharge. The effect of MSWF on ground water flow pattern is dependent upon ground water levels; the number, location and rate of pumping of the supply wells; the recharge from Christiana Creek and other industrial ground water use and recharge.

MSWF was proposed for inclusion on the National Priorities List (NPL) in December 1982 and was placed on the NPL in September, 1983.

Summary of Response Actions

First Operable Unit

In April 1985, U.S.EPA began a Phased Feasibility Study (PFS) to address alternatives for an alternate water supply. In August 1985, U. S. EPA signed a Record of Decision (ROD) recommending air stripping.

During 1987, construction was completed on a $2.6 million Superfund project at the Main Street Well Field. The project involved construction of a 6.45 million gallon per day water treatment facility. The facility was built to remove 99.1 % of the volatile organics from the City of Elkhart's public water supply by use of air stripping. The air stripping system includes three ten foot diameter towers each containing two fifteen foot layers of media. Each tower is supplied with air by a 9000 cubic feet per minute (CFM) blower. Other components of the facility include: modifications to existing water supply wells, new influent piping to supply the facility, prechlorination equipment, an acid wash cleaning system, three 2240 gallons per minute (GPM) effluent pumps, effluent piping to City of Elkhart storage reservoirs, and associated electrical and mechanical equipment. Funding for the project was provided by U.S. EPA and the Indiana Department of Environmental Management (IDEM). The construction was managed by the U.S. Army Corp of Engineers (USACE). Construction started June 23, 1986 and field work continued for 388 days. It was completed July 15, 1987. There were minor modifications from the approved design. These are outlined in the Remedial Action Report dated July 15, 1988.

Drinking water monitoring reports have been examined for the drinking water permit issued for the Elkhart Water Works and identify that permit requirements have been met without major exceptions. In accordance with the State Superfund Contract, the State monitored operation and maintenance of the air stripper until the execution of a unilateral order in January 1992.

Performance data for the towers, including influent and effluent TCE levels and maximum flow rates is monitored by the City and reported to the State of Indiana. An estimated 10,500 million gallons of water has been treated by the stripper since start up. During the period from 1993 through 1995, the average flow per day through the stripper was 4.83 million gallons. One tower is sampled every quarter to measure the level of contamination in the groundwater. Between 1993 to 1995, the years for which data was examined, the concentrations of TCE found in the influent varied from 7.4 to 27.0 ppb. The effluent from the stripper is sampled to determine the presence of contaminants of concern after stripping. Detection limits correspond to drinking water standards and, therefore, are not low enough to accurately determine the removal efficiency of the stripper.

While constructing the air stripper, investigation of the MSWF continued so as to determine the source of contamination. This investigation resulted in the Remedial Investigation Report which was released for public comment in May 1989. It was supplemented by the Phase III Technical Memorandum and Feasibility Study in January 1991. A second ROD was signed April 29,1991.

Based on these findings, the Agency issued a unilateral administrative order in January 1992. To accommodate potentially responsible parties at this site, the remedial action work was bifurcated into two operable units so that respondents to the unilateral administrative action could implement the recommended work. In addition to the remediation work, the unilateral order also transferred financial responsibility for operation and maintenance for the air stripper to the east- and west-side respondents. Operation and maintenance reports are provided to the State quarterly to ensure continued compliance.

Second Operable Unit: East Side Respondents

The second operable unit was implemented by the East-side respondents and included: delineation of the extent of soil volatile organic compounds (VOC) contamination; design, construction and operation of an in-situ soil vapor extraction (SVE) system to remove areas of soil exceeding clean up standards; and delineation of and removal of a paint layer residue and institutional control on properties with contaminated soil until clean up standards are achieved. Construction started September 1993, the date that U.S. EPA approved the design. Field work commenced October 1993. Field modifications are discussed in the Remedial Action Report for East Side Remedial Activities, Main Street Well Field Site, prepared by Geraghty and Miller dated February 1994 with an Addendum in August 1994 (GM Report).

Delineation investigations were performed by Geraghty and Miller in September 1992. The results were incorporated in the Preliminary Design Report for the SVE system dated December 7, 1992.

The SVE system for the east side properties includes a total of five extraction wells and consist of two separate blower stations. SVE Blower Station No. 1 is located on Excel's property and is connected to vapor extraction wells EW-1, EW-4A, EW-5A and EW-6A designed to operate at extraction rates of 105 Cubic Feet per Minute (cfm), 05 cfm, 15 cfm and 65 cfm, respective. Below-ground extraction piping from each of the wells is connected to a common manifold pipe inside a dedicated treatment equipment room located in the Excel manufacturing building. Above-ground extraction piping runs from Extraction Well EW-4A through the inside of the Excel manufacturing building to the blower station. The extraction piping inside the building is secured to existing pipe racks that are mounted on roof trusses. The locations of the extraction pipes from the individual

SVE wells and the location of the treatment equipment room are shown in the 1994 Remedial Action Report by Geraghty and Miller.

Blower Station No. 2 is located on Durakool property and is connected to vapor extraction well EW-2A, designed to operate at 110 cfm. The blower and associated mechanical equipment is housed inside a skid-mounted treatment enclosure. The location of SVE Blower Station No. 2 is also shown in the GM Report.

This system is automated such that it does not need to be manned on a continual basis. Routine inspection of the system and verification of operating parameters has been done on a regular schedule. The system has automatic system shutdown and remote alarm condition annunciation should adverse operating conditions develop.

The operation and maintenance plan for the system was approved as part of the design. Performance has been monitored since system startup in February 1994. Samples collected as part of the routine monitoring program have been analyzed utilizing data quality objectives at level lll. Use of level lll data quality objectives was approved until such time as clean up standards are to be verified. It was estimated in the Geraghty & Miller document “Prefinal Design Report, East Side Remedial Activities, Main Street Well Field Site, Elkhart Indiana”, dated September 1, 1993, and supplemented by Geraghty and Miller letter dated September 24, 1993, that there would be a 20 percent reduction during the first day of operation and it would take approximately two and a half years (August 1996 calculated by the calendar) to achieve 95 percent mass removal. Upon attainment of soil clean up standards, respondents will have to modify the quality assurance project plan to utilize data quality objectives at level IV and petition the U.S. EPA for system shut down.

System monitoring has been performed in accordance with Appendix K of the final design dated September 1993. An estimated 1600 pounds of volatiles has been extracted from the soils. The progress reports have recorded a marked decrease in the amount of vapor being extracted by the wells. Based on extracted vapor analytical data collected to date by the East Side Respondents, volatile organic concentrations appear to have reached asymptotic levels. The Agency is currently reviewing a request to implement intermittent system operations.

Third Operable Unit: West Side Respondents

The third operable unit, implemented by the West-side respondents, includes installation of a 10" force main, two extraction wells, three monitoring wells, a tie in vault to the existing stripper and associated construction activities. Construction started September 30, 1993, the date the design was approved by U. S. EPA. Field work was performed March 1994 through September 1994. Field modifications that deviated from the

approved design are discussed in the Remedial Action Report for the Extraction Well and Force Main System dated December 1994 prepared by Montgomery Watson.

The operation and maintenance plan for the system was approved as part of the design. Samples collected as part of the routine monitoring program are to be analyzed utilizing data quality objectives at level III until the respondents feel that they can meet clean up standards. At that time, a revised quality assurance plan will have to be implemented before samples can be taken to verify clean up standards have been met.

Groundwater samples were collected from wells on the west side of the well field and common wells monthly for the first year of operation and then quarterly thereafter. Sampling and groundwater level measurements are being carried out in accordance with the schedule and terms of the approved monitoring program. The interceptor wells continue to provide plume capture upgradient of the municipal well field. VOC contamination in groundwater continues to be identified through sampling.

Well Abandonment

Roy F. Weston, the EPA's oversight contractor, abandoned all unused wells that were constructed by the U.S. EPA while investigating this site. Monitoring wells that are not part of either respondents monitoring system and were commissioned by U.S. EPA, were abandoned this summer in adherence with county regulations. Both respondent groups have been advised to verify that they have also abandoned unused wells.

II. REMEDIAL OBJECTIVES

The primary objective of the first ROD at the Main Street Well Field was to protect public health by providing a reliable supply of safe, potable water to those consumers dependent on Main Street Well Field. In addition, this response measure was designed to be a consistent and integral part of the final remedy.

The purpose of the second response actions implemented in accordance with the second ROD by the East and West-side respondents was to prevent current or future exposure to the contaminated soils and contaminants migration into the ground water east of the well field, and to prevent current and potential future contaminant migration into the well field from the west and east, thus restoring the well field to its highest beneficial use.

III. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The remedial action has met all identified applicable, or relevant and appropriate (ARARs), federal and more stringent state requirements. ARARs for the selected remedies are listed below.

Applicable requirements:
Land Conservation Act of 1969;
Comprehensive Environmental Response Compensation and Lability Act 1980 as Amended by Superfund Amendments and Reauthorization Act in 1986;
Clean Air Act 1963 as Amended 1990; and
Safe Drinking Water Act with RCRA amendments of 1976.

Relevant and Appropriate requirements:
Environmental Manager Act IC 13-7 (1984 Supp);
Air Pollution Control Board, IAC Title 326;
Solid Waste Management Board, IAC Title 329; and
Solid Waste disposal Act as Amended by RCRA of 1976.

ARARs were not re-evaluated as part of this review.

IV. SUMMARY OF SITE VISIT

Quarterly and semi-annual ground-water sampling occurs at the site. Because of this, U.S. EPA oversight occurs periodically. The last sight visit occurred in May 1997.

V. RECOMMENDATIONS

Monitoring of the implementation of this action should continue.

VI. STATE OF PROTECTIVENESS

I certify that the remedy selected at this site remains protective of the public health and the environment.

VII. NEXT REVIEW

The next five-year review will be conducted in September 2002.